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KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

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| EXAMINER |
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BIRBACH, NAOMI L

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1792

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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| Office Action Summary | Application No. 10/583,815 | Applicant(s) PASHLEY, RICHARD MARK | |
| | Examiner NAOMI BIRBACH | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04132009</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 6, 7, 12, 13, 27-29, 33 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 6,059,886 to Shibano.

3. As to claims 1-3, Shibano discloses a method of cleaning a surface comprising applying a cleaning solution comprising water containing 0.01 to 5 ppm oxygen to a surface to remove foreign matter from the surface and cause it to be dispersed in the cleaning solution (Col. 2, lines 43-66, Col. 4, lines 11-18). While the gas dissolved in the cleaning solution is air, Shibano teaches that the amount of oxygen dissolved in the cleaning solution is used to indicate the total amount of gas dissolved in the cleaning solution (Col. 2, lines 60-65). Therefore, the water contains no more than 0.01-5ppm gas, and anticipates applicant's claimed values.

4. As to claim 6, Shibano further discloses that the surface is on an article and the method comprises cleaning the article in the water in a cleaning tank, which is a container (Col. 6, lines 17-25).

5. As to claim 7, Shibano further discloses applying ultrasonic energy to the cleaning solution, which causes the cleaning solution to be agitated (Col. 2, lines 55-60; Col. 3, lines 14-19).

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6. As to claim 12, Shibano further discloses a sealed tank for storing the water in which the water is deaerated and stored until it is supplied to the cleaning tank, where the water contained 0.01 to 5 ppm gas (Col. 5, lines 18-25, 60-65; Col. 6, lines 1-4).

7. As to claim 13, Shibano further discloses deaerating (degassing) a source of water to a gas range of 0.01 to 5 ppm (Col. 5, lines 18-34, 60-65).

8. As to claim 27, Shibano discloses an apparatus for cleaning a surface comprising a source of water containing 0.01-0.5 ppm of oxygen (Col. 2, lines 55-66; Col. 5, lines 1-25) and an inlet, which functions as a dispenser, for applying the water to a tank in which the surface is immersed, thereby applying water to the surface (Col. 5, lines 36-40; Col. 6, lines 1-12; 16-24) . While the gas dissolved in the cleaning solution is air, Shibano teaches that the amount of oxygen dissolved in the cleaning solution is used to indicate the total amount of gas dissolved in the cleaning solution (Col. 2, lines 60-65). Therefore, the water contains no more than 0.01-5ppm gas, and anticipates applicant's claimed value.

9. As to claim 28, Shibano further discloses that the surface and on an article and the apparatus includes a container for receiving the article (Col. 6, lines 16-26).

10. As to claim 29, Shibano further discloses that the apparatus contains an ultrasonic vibrator to cause cavitation (agitation) to the water (Col. 3, lines 15-19; Col. 6, lines 16-20).

11. As to claim 33, Shibano further discloses a sealed tank for storing the water in which the water is deaerated and stored until it is supplied to the cleaning tank, where

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the water contains 0.01 to 5 ppm gas, which anticipates no more than 1 ppm gas (Col. 5, lines 18-25, 60-65; Col. 6, lines 1-4).

12. As to claim 34, Shibano further discloses deaerating equipment for degassing a source of water to a gas range of 0.01 to 5 ppm, which anticipates no more than 1 ppm gas (Col. 5, lines 18-34, 60-65).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,059,886 to Shibano as applied to claim 1 above, and further in view of "Effect of Degassing on the Formation and Stability of Surfactant-Free Emulsions and Fine Teflon Dispersions" to Pashley.

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16. Shibano is relied upon as discussed above with respect to the rejection of claim 1.

17. As to claims 4 and 5, Shibano discloses that the amount of oxygen dissolved in the cleaning solution ranges from 0.01 to 5 ppm and teaches that the water may contain a surfactant to reduce surface tension of the cleaning liquid so that it can easily emulsify dirt on the surface, where the dirt is oil (Col. 3, lines 1-11). Shibano does not expressly disclose that the water contains no more than about 3 ppb or no more than about 0.3 ppb gas.

18. Pashley discloses that removing dissolved gases from an oil-in-water emulsion enables the formation of more turbid and stable emulsions, which do not require the addition of surfactants for stability (Page 1714: Abstract, Introduction). Pashley teaches a method of removing dissolved gas from an oil (non-aqueous solvent) and water mixture to achieve greater than 99.999% removal of dissolved gas (Page 1716).

Applicant discloses that 97% gas removal in the non-aqueous solution equates to about 10 ppm dissolved gas in the solvent (Page 9). In accordance, it is reasonably expected that greater than 99.999% removal equates to no more than 0.3 ppb dissolved gas.

19. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Shibano to include degassing the water so that it contains no more than 0.3 ppb gas as taught by Pashley for the benefit of enhancing the ability of oil droplets on the surface to break away from the oil phase (Page 1719), thereby improving dirt removal. One of ordinary skill would have been motivated to degas the water to no more than 0.3 ppb because Pashley teaches that

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this level of removed dissolved gases enables the formation of more turbid and stable emulsions, which do not require the addition of surfactants for stability (Page 1714: Abstract, Introduction).

20. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,059,886 to Shibano as applied to claim 1 above, and further in view of USPN 5,383,483 to Shibano (herein Shibano '483).

21. Shibano is relied upon as discussed above with respect to the rejection of claim 1.

22. As to claims 8-10, Shibano discloses that the water is applied to the surface through an inlet (Col. 6, lines 1-3), but does not expressly disclose that it is supplied to the surface by spraying, by means of an airless spray system.

23. Shibano '483 discloses a method of cleaning a surface by spraying deaerated cleaning solution onto the surface of a workpiece (Col. 7, lines 36-48). The cleaning solution is supplied to the spray gun through a cleaning supply passage where the cleaning solution is deaerated, so the spray system is understood to be airless (Col. 8, lines 4-11). The water is ejected through the spray gun to the surface in a stream, which results in the cleaning of the surface, meaning that the dirt on the surface is agitated by the stream of water (Col. 7, lines 54-64; Figure 5). As seen in Figure 5, the jet of water splits into multiple streams of water to contact the surface.

24. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Shibano to include applying the water to the

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surface by spraying as taught by Shibano '483 so that the water can be recovered in a reservoir beneath the article and reused (Col. 8, lines 32-39). One of ordinary skill would have been motivated to use an airless spray system to insure that gas does not reenter the water.

25. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,059,886 to Shibano as applied to claim 1 above, and further as evidenced by "Effect of Degassing on the Formation and Stability of Surfactant-Free Emulsions and Fine Teflon Dispersions" to Pashley and in view of USPN 5,788,781 to Van Slyke.

26.

27. Shibano is relied upon as discussed above with respect to the rejection of claim 1.

28. As to claim 11, Shibano discloses that the water may contain a surfactant to reduce surface tension of the cleaning liquid so that it can easily emulsify dirt on the surface, where the dirt is oil (Col. 3, lines 1-11). As evidenced by Pashley, surfactants serve as stabilizers (Page 1414).

29. Shibano does not expressly disclose that the stabilizer is hydrophilic.

30. Van Slyke discloses using hydrophilic surfactants in solutions to remove oil from surfaces, where the surfactant mixes with water to emulsify the contaminant and remove it from the surface (Col. 2, lines 58-65; Col. 11, lines 30-35). Since this method is successful in removing oil contaminants, it is understood that the addition of the hydrophilic surfactant alleviates redeposit ion of the dirt on the surface

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31. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Shibano to add a hydrophilic stabilizing material to the water used for cleaning for the benefit of enhancing the removal of contaminants from the surface.

32. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,059,886 to Shibano as applied to claim 1 above, and further in view of USPN 5,788,781 to Van Slyke

33. Shibano is relied upon as discussed above with respect to the rejection of claim 1.

34. As to claims 14-16, Shibano further discloses that a plurality of cleaning tanks may be utilized to clean a surface, where the cleaning tanks contain cleaning solutions with different gas contents (Col. 8, lines 10-22). Shibano also teaches that this method can be used to clean oil, which is hydrophobic dirt, and results in the oil being emulsified and dispersed in the cleaning solution (Col. 3, lines 5-10; Col. 4, lines 1-18).

35. Shibano does not expressly disclose dissolving the hydrophobic dirt using a non-aqueous solvent, where the non-aqueous solvent is applied to the surface prior to applying the water to the surface and where the surface is relatively separated from a liquid body of the non-aqueous solvent prior to applying the water to the surface.

36. Van Slyke discloses a method of cleaning unwanted oil from a substrate using a non-aqueous solvent, followed by rinsing the surface with water to create a water external emulsion, where the non-aqueous solvent and oil are dispersed (Col. 2, lines

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58-65; Col. 3, lines 1-14; Col. 11, lines 30-35). Van Slyke teaches that the non-aqueous solvent dissolves in the oil (hydrophobic dirt), but since both the non-aqueous solvent and hydrophobic dirt comprise oil, it is understood that they are dissolved in each other (Col. 11, lines 1-5). The surface is separated from the liquid body of non-aqueous solvent before being rinsed with water (Col. 11, lines 10-30).

37. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Shibano to include first dissolving the hydrophobic contaminants in a non-aqueous solution as taught by Van Slyke for the benefit of easing the removal of hydrophobic contamination from the surface, which is not water soluble.

38. Claims 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,059,886 to Shibano in view of USPN 5,788,781 to Van Slyke as applied to claim 14 above, and further in view of "Effect of Degassing on the Formation and Stability of Surfactant-Free Emulsions and Fine Teflon Dispersions" to Pashley.

39. Shibano and Van Slyke are relied upon as discussed above with respect to the rejection of claim 14.

40. As to claims 17-23, Shibano discloses that a plurality of cleaning tanks may be utilized to clean a surface, where the cleaning tanks contain cleaning solutions with different gas contents (Col. 8, lines 10-22). It is therefore understood that a multiplicity of cleaning solutions can be stored in each respective tank and associated sealed deaerating tank. Van Slyke further discloses that the non-aqueous solution comprises

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surfactants which serve to emulsify the contaminant and non-aqueous solution when rinsed with water to create a water external emulsion (Col. 11, lines 1-9, 30-35). The combination of Van Slyke and Shibano does not expressly disclose that the non-aqueous solvent applied to the surface contains no more than 10 ppm, 1 ppm, 0.3 ppm, 3 ppb, or 0.3 ppb gas.

41. Pashley discloses that removing dissolved gases from an oil-in-water emulsion enables the formation of more turbid and stable emulsions, which do not require the addition of surfactants for stability (Page 1714: Abstract, Introduction). Pashley teaches a method of removing dissolved gas from an oil (non-aqueous solvent) and water mixture to achieve greater than 99.999% removal of dissolved gas (Page 1716).

Applicant discloses that 97% gas removal in the non-aqueous solution equates to about 10 ppm dissolved gas in the solvent (Page 9). In accordance, it is reasonably expected that greater than 99.999% removal equates to no more than 0.3 ppb dissolved gas.

Pashley further discloses that the degassed solvent can be stored indefinitely under vacuum (Page 1720).

42. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Shibano and Van Slyke to include degassing the non-aqueous solution so that it contains no more than 0.3 ppb gas as taught by Pashley for the benefit of enhancing the ability of oil droplets to break away from the oil phase (Page 1719), thereby improving dirt removal. One of ordinary skill would have been motivated to degas the non-aqueous solution because the removal of dissolved

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gases enables the formation of more turbid and stable emulsions, which do not require the addition of surfactants for stability (Page 1714: Abstract, Introduction).

43. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,059,886 to Shibano in view of USPN 5,788,781 to Van Slyke as applied to claim 14 above, and further as evidenced by “Effect of Degassing on the Formation and Stability of Surfactant-Free Emulsions and Fine Teflon Dispersions” to Pashley.

44. Shibano and Van Slyke are relied upon with respect to the rejection of claim 14.

45. As to claims 24-26, Van Slyke further discloses that the non-aqueous solvent may comprise silicone oil (Col. 5, lines 27-32), hexane or dodecane (Col. 6, lines 1-5).

46. As evidenced by Pashley, dodecane is a hydrocarbon oil, which is inherently hydrophobic (Page 1714, Introduction; Page 1715, Materials and Methods).

47. Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,059,886 to Shibano as applied to claim 27 above, and further in view of USPN 5,383,483 to Shibano (herein Shibano ‘483).

48. Shibano is relied upon as discussed above with respect to the rejection of claim 27.

49. As to claims 30-32, Shibano discloses that the water is applied to the surface through an inlet, which is a dispenser (Col. 6, lines 1-3), but does not expressly disclose that the dispenser comprises a sprayer or that the sprayer is part of an airless spray

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system or that the dispenser applies multiple streams of water to the surface to agitate dirt on the surface.

50. Shibano '483 discloses an apparatus for cleaning a surface with deaerated cleaning solution with a dispenser comprising a sprayer (Col. 7, lines 36-48). The spray system comprises cleaning supply passage where the cleaning solution is deaerated, which is connected to the spray gun, so the spray system is understood to be airless (Col. 8, lines 4-11). The water is ejected through the spray gun to the surface in a stream, which results in the cleaning of the surface, meaning that the dirt on the surface is agitated by the stream of water (Col. 7, lines 54-64; Figure 5). As seen in Figure 5, the jet of water splits into multiple streams of water to contact the surface upon release from the dispenser nozzle.

51. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus taught by Shibano to include a sprayer for applying the water to the surface as taught by Shibano '483 so that the water can be recovered in a reservoir beneath the article and reused (Col. 8, lines 32-39). One of ordinary skill would have been motivated to use an airless spray system to insure that gas does not reenter the water.

52. Claims 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,059,886 to Shibano as applied to claim 27 above, and further in view of USPN 5,788,781 to Van Slyke.

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53. Shibano is relied upon as discussed above with respect to the rejection of claim 27.

54. As to claims 35, 37 and 38, Shibano further discloses that a plurality of cleaning tanks may be utilized to clean a surface, where the cleaning tanks contain cleaning solutions with different gas contents (Col. 8, lines 10-22). Shibano also teaches that this apparatus can be used to clean oil (Col. 3, lines 5-10; Col. 4, lines 1-18). Each cleaning tank contains an inlet, which is a dispenser, for supplying cleaning solution to the cleaning tank (Col. 8, lines 39-48). The cleaning solution is stored in sealed tank where it is deaerated and stored until it is supplied to the cleaning tank (Col. 5, lines 18-25, 60-65; Col. 6, lines 1-4). It is understood that in the embodiment where a plurality of tanks with a plurality of cleaning solutions are utilized to clean a surface, each would contain a respective deaerating storage tank and inlet (dispenser). Shibano discloses equipment for deaerating a solution to a level of 0.01-0.5 ppm gas, which is less than 10 ppm gas (Col. 2, lines 55-66; Col. 5, lines 1-25).

55. Shibano does not expressly disclose that the cleaning solution is a non-aqueous solvent or that one dispenser used for applying the water and non-aqueous solvent.

56. Van Slyke discloses a source of non-aqueous solvent which used to clean unwanted oil from a substrate before rinsing the surface with water (Col. 2, lines 58-65; Col. 11, lines 1-9, 30-35, 55-63).

57. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus taught by Shibano to include a source of non-aqueous solvent as taught by Van Slyke for the benefit of enhancing the cleaning process

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performed by the apparatus, in the case where the dirt is hydrophobic (Col. 11, lines 1-5, 30-35).. It would have been obvious to one of ordinary skill that the non-aqueous solvent could be stored, dispensed, and degassed in the apparatus taught by Shibano with a reasonable expectation of success.

58. As to claim 36, the combination of Shibano and Van Slyke does not expressly disclose that one dispenser is used for applying both the water and non-aqueous solvent. However, it would have been obvious to one of ordinary skill to use a plurality of sealed deaerating tanks instead of a plurality of cleaning tanks as taught by Shibano, so that multiple cleaning solutions with different gas contents could be supplied via the same inlet to the same cleaning tank so that the substrate does not have to be moved between tanks (Col. 5, lines 18-25; Col. 8, lines 10-25). Although Shibano does not disclose a plurality of sealed deaerating tanks, the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced (MPEP 2144.04 VI B).

Conclusion

59. Applicants' attention is drawn to the fact that the instant claims are directed to at least two distinct inventions – a method of cleaning a surface, represented by claims 1-26 (Group I) and an apparatus for cleaning a surface, represented by claims 27-38 (Group II). The restriction requirement is not made at this time; however it may be imposed later if the claims are amended to introduce additional limitations to each invention, which would require an additional search in each Group of claims.

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60. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAOMI BIRBACH whose telephone number is (571)270-7367. The examiner can normally be reached on Monday-Friday, 8:00am-5:30pm.

61. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on 571-272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

62. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. B./
Naomi Birbach
Examiner, Art Unit 1792
5/11/09

/Michael Kornakov/
Supervisory Patent Examiner, Art Unit 1792